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AUTHOR Jacob, Evelyn; Crandall, Jo Ann
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ABSTRACT

In a response to the Mikulecky and Diehl examination of work-related literacy, this paper points out the need for data based on ethnographic approaches to research and more realistic assessments of text difficulty. Also suggested are questions to which future research might respond: How much of functional literacy is really functional competency? Do we overestimate literacy demands? Does literacy play a symbolic role in distinguishing high-status, high-income occupations from lower-status, lower-income occupations? How do adults develop job reading ability while on the job? What techniques could those teaching reading employ to more closely simulate that learning? Problems with using readability formulas are pointed out, and the use of cloze tests is recommended as a better approach to measuring literacy levels. Also noted are the parallels between adult reading programs and adult English as a second language programs. (AEA)

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Job-Related Literacy: A Look at Current and Needed Research

Evelyn Jacob and Jo Ann Crandall
Center for Applied Linguistics

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This paper is an extension of comments made at the Functional Literacy Conference, Indiana University, Bloomington, Indiana, June, 1979. Proceedings of the Conference are forthcoming.

Evelyn Jacob is co-principal investigator (with Sylvia Scribner) of the Industrial Literacy Project which is funded by the Ford Foundation. Jo Ann Crandall is project director of a research and program development project focusing on Functional Reading in a Bureaucratic Setting. Both projects are based at the Center for Applied Linguistics.

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The question "What is functional literacy?" has been a recurrent focus of both the formal papers and discussions of this conference. Some participants asked the question from a theoretical perspective; others, from an assessment point of view; and others, from an examination of the requirements for specific jobs. Many seemed to be searching for one definition of functional literacy that could either act as a guideline for future research or for future national assessments. The motivation for seeking an answer to this question is understandable, given the widespread concern about the apparent decline in national literacy levels and the increasing use of minimum competency tests in the schools. However, we question whether there can be one answer to this question. Functional literacy is closely tied in with the demands and social context of a particular setting. Rather than trying to find one answer to this question we are concerned with how one determines functional literacy in particular settings. Of special interest to us are job-related literacy and the paper by Mikulecky and Diehl which addresses issues related to job-related literacy. In our comments, we will examine the Mikulecky and Diehl paper in detail and in the process, argue for various types of ethnographic observations to determine what functional literacy in a particular setting is.

Mikulecky and Diehl outline many of the problems inherent in work which tries to define or assess some kind of national, generalized functional literacy. They point out the difference between being able to read materials supposedly necessary to complete a task and the ability to actually accomplish the task. They accurately define one of the literacy requirements of many jobs as taking tests; this is especially a problem since these tests are usually given in settings which deprive the individual of access to other cues or sources of information that they might consult on the job in accomplishing job tasks. They also address the question of the effect of attitude upon literacy performance.

They conclude that "the need exists, then, to examine functional literacy in the actual contexts where the literacy demands occur; furthermore, attitudes, motivations, and contextual influences that may impact on a person's functional literacy ability need to be examined" as well.

Mikulecky and Diehl try to respond to the problems in a generalized approach to functional literacy by examining job-related literacy through interviews with people in 100 different occupations. Through these interviews, they have examined the general nature of literacy tasks encountered on the job in these occupations, the difficulty of job materials, the relationships between individuals' reading abilities and the difficulty of job materials, the relationships between literacy and job success, and the characteristics of "competent" and "non-competent" readers. Their results are provocative and bring us a step closer to understanding job-related literacy. Moreover, their methodology and results raise many questions for future study, some of which we will examine here. We will deal first with some of the methodological issues raised by their paper and then outline some of the more interesting research questions that their work raises.

Mikulecky and Diehl provide a good basis for further research in job-related literacy. In trying to get a general picture of the literacy tasks of a number of jobs, they were forced to rely on interviews with various employees and employers. However, they recognize the shortcomings of self-reported data, especially with regard to literacy. As they point out, people are often unaware of the reading they actually do on the job. In our work, we have found a similar lack of awareness of literacy tasks. Crandall found that clerical personnel often responded that they didn't have to do much reading, when in fact, they frequently were scanning documents for a number or name in order to complete a form, looking through files to find the answer to a question, or recording changes from written to typed copy. Upon further questioning, however,

many became conscious of the amount of reading they actually do. Jacob and Scribner have had similar results when interviewing supervisors. They asked supervisors in a dairy to describe the reading and writing activities of persons they supervised; they also asked for samples of forms used. When observing these personnel actually performing their jobs, Jacob and Scribner found that the literacy activities and forms had both been under-reported by the supervisors.

Literacy activities may involve reading and writing short notes or messages, filing, and retrieving information from documents to answer a short question over the telephone. These would rarely be identified as "literacy activities" by people performing them, yet they require writing and reading and, in fact, may occur frequently during the work day. It is these kinds of activities which people often discount as "not really reading". Mikulecky and Diehl believe that people fail to report these when asked about literacy activities because they are so much a part of the occupational task. However, it may also result from the different conceptions people have of what reading is. It is our opinion that people's definitions of what constitutes reading may differ from that of the researcher. "Reading" in school was often correlated with "studying" or "reading to get the main idea" - both part of reading to learn in Sticht's terms (this volume) - rather than reading to get a job done.

Thus, it becomes important to verify not only people's impressions of what they read, the amount of time they believe they read, and the purposes for which they read, but also their conceptions of what reading and writing are. A variety of ethnographic approaches can be used in gathering the data: participant-observation, interviews with people as they are working with the materials, and even attempts by researchers to perform the tasks.

While emphasizing the need to amplify self-reported data with extended

ethnographic observations, we are also aware of the methodological problem which this presents. As linguists and anthropologists, we are acutely aware of the problem of the "observer's paradox": If one simply observes people reading and writing, it may be difficult to ascertain their purpose, though listening to what people talk about after reading or watching what they write in response to the document may provide some clues. However, if one asks people what they are doing, while they are doing it, as well as observing what they are doing, one has already begun to change the situation and may affect the data.

One way of handling this dilemma, however, is to begin by observing people at their jobs, asking them to explain what they are doing and why they are doing it. After the observer has a good overview of the structure of the job, she can then do close observations of the job with minimal interruption or change in the natural situation. A structural description of the job can help place individual activities into a meaningful context and clarify the "function" of functional literacy, Jacob and Scribner have found.

However, a structural description or a typical job description is not sufficient to define the functional literacy requirements of the job, since these usually focus on the routine and recurrent aspects of the job and tend to omit the "miscellaneous" tasks which so often involve reading and writing. Oral job descriptions may lose even more of the functional literacy requirements of the job, since many tasks are out of the consciousness of the person being interviewed. Jacob and Scribner have found that for some people a work day involves a complex interweaving of various parts of a variety of tasks, not what the neat, linear job description indicates and only observations can uncover the literacy tasks associated with this interweaving of various tasks.

If a researcher can also be "trained" to complete some of the tasks (as

Crandall is doing), then problems in affecting the data can be mitigated even more, since another reference point becomes available by which to judge the literacy tasks demanded by the job.

Similar problems arise in the examination of documents read and written in a particular setting. Merely collecting samples of written materials and submitting them to a test of difficulty is not enough. Documents do not stand alone. First, it is often difficult to determine what skills are needed to use the documents by examining the documents in isolation. Graphic materials are a good case in point. An examination or assessment of their "difficulty" tells us little about the skills involved in using these graphs, whether a person must record information on them or abstract information from them. Second, documents may be put to a variety of uses by the various employees who encounter them. One person may record information on a form, another might total the figures, and another might keypunch information from that form. Someone else might compare the original with the keypunch format and then give it to someone else to file. Each of these operations involves different skills, all of which need to be taken into account in assessing literacy demands or creating effective reading improvement programs.

The question of document "difficulty" can be a misleading one, not only for the above reasons, but also because of the means by which many researchers, including Mikulecky and Diehl, assess difficulty. A major problem with the Mikulecky and Diehl study is their reliance upon readability formulas (Fry, Fog, FORCAST) to assess the difficulty of reading materials. Not only do these not apply to graphic materials, which Mikulecky and Diehl found most "vital", but they are often invalid measures of even connected discourse. To begin with, readability formulas only measure surface structure and they equate

short, simple sentences with ease of comprehension. They take no account of word order, of the syntactic or semantic complexity of the discourse, or of the role of context in understanding connected prose. By readability formulas, a series of short, unrelated sentences characteristic of primers would be found simpler than one sentence which explicitly states a causal or comparative relationship. A series of short sentences may be syntactically simpler but the inferencing burden they create is more difficult for the reader. Moreover, as reading materials become increasingly unnatural or divorced from natural discourse, we can expect problems in comprehending these materials to rise.

Recently, an excellent example of the problems with readability forms presented itself with the newly-revised income tax forms, which were rewritten to an eighth grade level as measured by readability formulas. When an eighth grade teacher gave these to her classes to fill out, not one was able to do so. Does that mean that they are "defective" eighth graders or is the concept of "eighth-grade readability" in error?

The reasons for the popularity of readability formulas is that they provide a quick, cheap, quantifiable assessment - if not very accurate - of the reading difficulty of prose. When these formulas work, it is because what they measure coincides with other diagnostic criteria. For example, excessive subordination (multiple embeddings) can create a problem in comprehension (as measured by paraphrase testing or other tests which require action based on the reading passage), but not because of the number of words in the sentence or the number of large words: rather, it is because the sentences may contain too many propositions or concepts for anyone to grasp in the reduced time of the sentence or because the sentence may have more than one possible reading.

Mikulecky and Diehl's use of the cloze tests seems a better approach,

since cloze provides a good measure of one's ability to use semantic, syntactic, and discourse clues in understanding a text. Since redundancy is a natural feature of discourse, cloze enables the researcher to gauge how well a person can rely on that redundancy to make sense of the text. However, rather than a random cloze, where every fifth or seventh word is deleted, a more interesting and informative approach might be one similar to that taken by Dieterich, Freeman and Griffin (1978). They constructed cloze tests in which they removed words which were carefully selected because of syntactic, semantic, or inferencing reasons. They provided alternatives and created a multiple choice cloze test which not only assesses how well one reads, but also can provide an index to the particular skills and strategies which people use or lack. Crandall is finding this an informative approach in the reading program which she is developing. However, it does not substitute for ethnographic research; it provides another look at reading strategies and abilities.

We hope that the need for data based on ethnographic approaches and more realistic assessments of text difficulty is apparent from a research point of view. This data is also especially important to those who are working in adult reading programs. Too often, these reading programs are "canned", including routine exercises in reading comprehension such as choosing the "best" title or selecting the main thought, with little regard for the relationship which exists between those exercises and the actual reading demands of the job. It isn't even enough to create a reading program using authentic materials, unless substantial interview and observation about how these materials are used precedes the development of the program. Work which attempts to isolate the kinds of materials that people read on the job, the interaction between the reader and the document, and the variety of strategies people use in reading that

document will lead to more relevant, practical reading programs, especially important for adults. The more "functional" the reading program, the more it will correlate with the adult's other responsibilities and needs and the more we can expect the adult to benefit from it.[1]

Mikulecky and Diehl's work represents a significant beginning in the examination of different kinds of job-related literacy. However, it is important to extend the data through other methodologies - especially ethnographic approaches - to observe and interview more than one representative of each job, and to use appropriate instruments to examine text difficulty in order to create a valid profile of the reading and writing demands of that job and the strategies which people in those jobs use to fulfill these demands.

Their work also raises a number of interesting areas for future research which we will briefly outline here.

1. Mikulecky and Diehl make the distinction between "functional literacy" and "functional competency" at the outset, recognizing that one can be illiterate and still get the job done, just as one can be literate and still not function competently on the job (for a variety of physical, psychological, or other reasons). From their study they report that those who read the most on their jobs are also those who do the best in job-related cloze tests. While they recognize that thirty-five is a small sample, they report that "some literacy ability is acquired through experience with specific job materials". They also found that job-related literacy is usually higher than general literacy and that "job experience seems to play an important role in this difference". An interesting problem presents itself. How much of functional literacy is really functional competency? If job-related literacy improves with job experience and if workers often fail at reading tasks in reading tests (artificial testing

situations) and yet succeed in performing them when on the job (where they have access to other cues from the job setting), how can we be certain that what we are measuring in job-related reading tests is reading competence rather than general job competence? It is a question which may not have an answer, since one cannot measure reading ability without simultaneously measuring real world knowledge as it comes into play in understanding that reading passage; that is, familiarity with the specialized vocabulary of the job and the general understanding of the work and the specific tasks discussed in the reading passage will obviously contribute to better understanding of the passage. Is that functional literacy or functional competency, or both?

2. Mikulecky and Diehl also hypothesize that "it may be that the literacy 'demands' of occupations are far less than we had realized" since so many of the interviewees found the majority of materials that they read to be "important" but not "vital" to completing their job. This is an important question to look into further. Do we overestimate literacy demands? It is interesting that Sticht (this volume) found that the reading demands for preparing for a job (reading to learn) are much greater than those for performing the job (reading to do). Perhaps we have overestimated literacy demands for job performance, and were we to consider alternative teaching and learning strategies, we could open a number of occupations to people who we have previously believed were incapable of performing them. Of course this is mere hypothesis until further study of the question with a number of individuals from a number of occupations. More than self-reported data is needed to answer this question since people may believe they can accomplish a task without reading a document, but when required to do the task would find it difficult or be unable to continually perform it without reading.

3. A related interesting hypothesis from their research concerns the "symbolic role" of literacy. Mikulecky and Diehl suggest that "to a certain extent, literacy may be playing a symbolic role in distinguishing high status, high income occupations from lower status, lower income occupations". We need a great deal more research to evaluate this suggestion. It may be that higher status, "professional" jobs require more literacy skills, but then again, with dictaphones and conferences, we may find that lower-paid, lower-status employees may really perform high literacy tasks. It is an interesting question.

Crandall is finding that many clerical employees in lower-status jobs who actually perform substantially complicated reading tasks for several hours a day have a view of themselves as "poor readers" who need to take a course in "reading comprehension". Their self-conception effectively bars them from attempting those higher status jobs which appear to have higher literacy demands. This example demonstrates the potential significance of Mikulecky and Diehl's suggestion about the symbolic role of literacy.

4. Mikulecky and Diehl found that individuals perform better on job-related cloze than general cloze and they suggest that job reading ability develops with job experience. If that is the case, how do adults learn on the job? How do they develop job reading ability? What techniques could those teaching reading employ to more closely simulate that learning?

In summary, we found the Mikulecky and Diehl paper both informative and provocative. It represents very important work in building a research base for analyzing job-related literacy which can help us understand people's use of cognitive skills in everyday life and help in creating reading programs which effectively and efficiently simulate the kinds of learning that occur on

the job. Job-related literacy, especially, must be viewed in terms of functional literacy. Methods or measures which separate individuals and documents from the natural settings in which they interact need to be replaced by more naturalistic and authentic approaches.

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[1]Footnote: It is interesting to note the parallels between adult reading programs and adult English as a second language programs in this country. Practitioners in both are becoming increasingly aware of the need to make these "functional", basing instruction upon needs assessments and task analyses, as well as observations, of what people have to be able to do on their jobs or to survive as adults in the United States. No longer do ESL teachers think they are simply teaching "English": instead, they attempt to tailor language instruction to the specific language demands required for vocational training or preparation for a job. Adult reading programs often still teach "reading", but they could benefit a great deal from the needs assessment techniques and the task analyses being performed by researchers and teachers, as well as curriculum developers, in Vocational ESL (English for auto mechanics, for computer programmers, for chefs, for technicians, et cetera).

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